

## Disparities in U.S. Air Force Preventive Health Assessments and Medical Deployability

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**ABSTRACT** Objective: This study aimed to determine whether preventive health assessment currency and medical nondeployability rates were the same for all active duty members in the U.S. Air Force. Methods: Deidentified data were compiled from personnel and readiness databases. Prevalence of current preventive appointments and nondeployable status were calculated by race/ethnicity, gender, and rank, and adjusted for age. Results: Permanent medical nondeployability was higher for Asian/Pacific Islanders and non-Hispanic Blacks than non-Hispanic Whites ( $p < 0.05$ ), although current preventive health appointments were higher for minorities. Statistically significant differences were identified by gender, but were clinically insignificant. Currency rates for prevention appointments were lowest for senior officers, whereas senior enlisted members were more likely to be medically nondeployable ( $p < 0.05$ ). Conclusions: Evidence of disparities in medical deployability rates for Asian/Pacific Islanders, non-Hispanic Blacks, and senior enlisted active duty members suggest that further investigation is warranted to ensure existing policy and procedures do not contribute to health disparities.

Maintaining the health and fitness of the active duty force is a critical task for the military healthcare system to support worldwide deployments.<sup>1</sup> However, racial and ethnic differences in health, often labeled as health disparities,<sup>2</sup> have been well established within the civilian health care setting<sup>3</sup> and may pose a serious threat to the overall health of the active duty force. Furthermore, there is compelling evidence that disparities in health also exist for women<sup>4</sup> and those of lower socioeconomic position.<sup>5</sup>

In the U.S. Air Force (USAF), force-shaping efforts have demanded careful scrutiny of health issues that could preclude active duty members from their ability to deploy.<sup>6</sup> Because of the negative impact health disparities could have on overall medical deployability rates, it is essential to determine whether health disparities exist in the USAF for active duty members of a minority race/ethnicity category, women, or those in lower ranks.

In a comprehensive review of existing research on racial and ethnic disparities in health, the Institute of Medicine concluded that disparities were pervasive within the civilian healthcare system, but appeared less pronounced in the military system.<sup>3</sup> In fact, there is evidence that although these disparities are less prevalent, the negative outcomes can be just as pronounced for active duty members, particularly in the development of type II diabetes,<sup>7</sup> asthma incidence and severity,<sup>8,9</sup> pregnancy outcomes,<sup>10-14</sup> breast cancer outcomes,<sup>15-17</sup> and mental health.<sup>18,19</sup>

Active duty women have also demonstrated worse health outcomes, prompting congress to fund over 100 research studies to improve the health of military women.<sup>20</sup> The settings that have identified clear disparities between men and women have focused mainly on injury rates in the training environment,<sup>21,22</sup> as well as injuries and hospitalizations on active duty.<sup>23,24</sup> Numerous biomedical factors have also been studied intensively to ensure equipment, as well as readiness and fitness standards were not causing unintended health consequences for women.<sup>20</sup>

Lower ranks have also been found to have worse outcomes, with junior enlisted members more likely to develop type II diabetes<sup>7</sup> or to be discharged following a back injury.<sup>25</sup> Family members of those of lower ranks have also demonstrated higher grade of breast cancer at diagnosis<sup>15</sup> and are less current in childhood immunizations.<sup>26</sup> Again, these results mirror the findings from civilian healthcare systems, with lower socioeconomic position demonstrating worse outcomes.<sup>5</sup>

The purpose of this study was to determine whether overall medical deployability rates were the same for all active duty members in the USAF, regardless of race/ethnicity, gender, or rank. Additionally, currency of a preventive health assessment was also examined to evaluate whether this important prevention and screening effort was provided equitably.

### Definitions

In the comprehensive review of health disparities research, the Institute of Medicine identified an important theoretical model to consider health disparities for individuals with equal access to care. Within the context of health disparities research, this model suggests that differences in healthcare measures can be the result of intended or unintended inequitable system-level policies or discrimination during individual interactions with healthcare members, as well as appropriate clinical differences or patient preferences.<sup>3</sup> According to this model, only

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the system-level policies and individual discrimination comprise an actual disparity.

Although appropriate clinical factors or patient preference could account for some of the difference identified, preventive health assessments are mandated for all active duty, and medical nondeployability determinations are based on objective clinical and operational criteria. Furthermore, because the population consists of active duty military members, patient preference becomes a negligible contributor to any differences that might be identified. Because of these factors, statistically and clinically significant differences were considered a disparity.

In the USAF, a Preventive Health Assessment (PHA) is an annual requirement, governed by Air Force Instruction (AFI) 48-123. A PHA includes a complete review of the medical record, health history, and results of a health survey accomplished by trained clinical staff at the individual military treatment facility.<sup>27</sup> Additionally, clinical preventive services appropriate for the individual's age, sex, medical and family history are accomplished or scheduled at that time, including blood pressure screening, cholesterol screening, and cervical cancer screening.<sup>27</sup> All information is documented in the active duty member's medical record, as well as the PHA and Individual Medical Readiness ("PIMR") database. Although an annual requirement, a PHA was considered current if it had been completed up to 18 months prior, as AFI 48-123 allows PHAs to be accomplished up to 6 months after it is due.<sup>27</sup>

Permanent medical nondeployability requires a more complex determination. If an individual has a medical condition that precludes them from being deployed to any setting for an unlimited amount of time, and the condition will not resolve within 12 months, the individual will be referred to a medical evaluation board.<sup>28</sup> The medical evaluation board then determines whether the individual is considered "fit" for duty—defined as the ability to adequately perform the duties appropriate for the individual's rank and position.<sup>29</sup> If an individual is determined to be fit for duty, but not medically deployable, then he or she is coded in the assignment system as having a "medical assignment limitation," or code-"C".<sup>28</sup> In this study, permanent medical nondeployability was defined as receiving a code-C in the assignment system.

Race/ethnicity was defined as one of five race or ethnicity categories as identified in the Defense Enrollment Eligibility Reporting System (DEERS): non-Hispanic White, American Indian/Alaska Native, Asian/Pacific Islander, non-Hispanic Black, or Hispanic. Rank, as identified in DEERS, was collapsed into four different categories: junior enlisted (E1–E4), senior enlisted (E5–E9), junior officers (O1–O3), and senior officers (O4–O6). Gender was defined as an individual's sex, as identified in DEERS.

## METHODS

DEERS is the Department of Defense (DOD) data repository with complete personnel information to determine benefits and entitlements for all military personnel.<sup>30</sup> Oversight

of DEERS lies within the office of the Under Secretary of Defense for Personnel and Readiness<sup>31</sup> and data are entered by DOD personnel that have received appropriate information assurance training and certification.<sup>32</sup>

The PIMR database contains clinical and administrative data for all active duty AF members to determine temporary and permanent medical deployability. Local oversight of the database at every AF base is accomplished by the Force Health Management office<sup>27</sup> and is centrally maintained by the Air Force Medical Operations Agency. Data are entered into PIMR by the trained clinical staff completing the annual PHA; depending on the individual military treatment facility, the staff members completing the PHA may be integrated into the clinic setting or may function separately from the clinic staff. However, all results are verified by the individual active duty member's primary care provider (a physician, physician assistant, or nurse practitioner).<sup>27</sup> PIMR data are also reviewed and updated at each medical appointment and every time the active duty member arrives at a new assignment.<sup>27</sup>

Institutional review board (IRB) approval for the study was received from the academic institution where the research was conducted. Approval was also requested and received from the USAF Surgeon General's Office of Research Oversight and Compliance Division, the IRB at the Uniformed Services University of the Health Sciences, and the USAF Clinical Informatics Branch.

Data were retrieved by the USAF Clinical Informatics Branch from the DEERS and PIMR databases in October 2008. Data were gathered looking retroactively up to 18 months prior for the most recent PHA date. Information from all Air Force members who had been on active duty at least 12 months were included in the data set; flag officers (one-, two-, three-, and four-star generals) were excluded from the sample because of the very small numbers and personalized healthcare that is provided. The resulting sample contained information on 298,549 active duty members.

Logistic regression models were developed when the data were received, and prevalence of having a current preventive health assessment and permanent medically nondeployable status were calculated by race/ethnicity, gender, and rank. Because it was identified that age strongly influenced both outcome variables, spline terms were created at age 20, 25, 30, 35, and 40 and included in the final model to adjust for the nonlinear effect of age.

## RESULTS

A majority of the population (71.6%) was White non-Hispanic and was also primarily male (80.7%), as summarized in Table I. Nearly half (44.7%) were included in the senior enlisted rank category, with junior enlisted at 34.7%. Officers comprised 20.7% of the population, with junior officers 11.9% and senior officers 8.8%. This was also a very young population, with over 50% under the age of 30, and 87.5% under the age of 41. PHA currency was very high, at 94.4% of the population, and permanent medical nondeployability was quite low, at 2.4%.

**TABLE I.** Demographics of All Air Force Members on Active Duty at Least 12 Months (Excluding General Officers)

	No. of Individuals (N = 297,429)	%
<b>Race/Ethnicity</b>		
American Indian/Alaska Native	2,738	0.9
Asian/Pacific Islander	14,016	4.7
Black Non-Hispanic	44,142	14.8
White Non-Hispanic	213,001	71.6
Hispanic	16,635	5.6
Declined/Unknown	6,897	2.3
<b>Gender</b>		
Male	240,033	80.7
Female	57,396	19.3
<b>Rank Category</b>		
Junior Enlisted (E1-E4)	103,076	34.7
Senior Enlisted (E5-E9)	132,821	44.7
Junior Officer (O -O3)	35,500	11.9
Senior Officer (O4-O6)	26,032	8.8
<b>Age</b>		
18-20	13,660	4.6
21-25	85,819	28.9
26-30	70,047	23.6
31-35	47,620	16.0
36-40	43,235	14.5
41+	37,048	12.5
<b>Outcome Variables</b>		
Current Preventive Health Assessment	280,819	94.4
Medically Nondeployable	7,072	2.4

### Race/Ethnicity

PHA currency rate differed statistically significantly by race/ethnicity ( $p < 0.001$ ). However, predicted currency rates for every race/ethnicity category, adjusted for gender and rank (Table II), remained above 90%. Overall, non-Hispanic White active duty members had statistically significantly lower PHA currency than all other race/ethnicity categories ( $p < 0.05$ ) although the difference was not clinically significant (less than 1%). For active duty members under the age of 30 (more than 50% of the population), non-Hispanic Blacks demonstrated a statistically significantly higher PHA currency rate than any other race/ethnicity category ( $p < 0.05$ ) although the differences were also fairly small (less than 3%).

Permanent medically nondeployable status also differed statistically significantly by race/ethnicity ( $p < 0.001$ ). Even when adjusted for gender and rank, medical nondeployability increased with increasing age, as seen in Figure 1. The rate of permanent medical nondeployability, however, increased statistically significantly higher for Black non-Hispanics in comparison to all other race/ethnicity categories. In fact, at every age, Black non-Hispanics were more than 50% likely to be permanently medically nondeployable, compared to non-Hispanic Whites of the same age. Above the age of 30, Asian/Pacific Islanders were also statistically significantly more likely to be permanently nondeployable, although the differences were less pronounced. At almost every age, medical deployability rates for American Indian/Alaska Natives

and Hispanics were the same or lower (i.e., better) than non-Hispanic Whites.

### Gender

PHA currency also differed statistically significantly by gender ( $p < 0.001$ ). Overall PHA currency was statistically significantly higher for women ( $p < 0.05\%$ ) when adjusted for race and rank. However, as seen in Table III, the difference in PHA currency rates between men and women was less than 1%. Because the difference was so small, it was considered clinically insignificant. Permanent medically nondeployable status also differed statistically significantly by gender ( $p < 0.001$ ). When adjusted for race and rank, compared to men, women were more likely to be permanently nondeployable overall, and at every age category. Although these differences were statistically significant, the difference was also less than 1%, so these differences were also considered not clinically significant.

### Rank

Both PHA currency ( $p < 0.001$ ) and permanent nondeployability ( $p < 0.0001$ ) differed by rank category. Predicted PHA currency rates and permanent medical nondeployability status were calculated for each age category, although as expected, there were no senior enlisted or junior officer members under the age of 21. Similarly, all senior officers were above the age of 30. Although comparison for individuals under the age of 21 and for senior officers under the age of 30 is impossible, there were still important differences noted by rank.

When adjusted for race and gender, senior officers had the lowest overall PHA currency rates, consistently below 90%, as seen in Table IV. Except for junior enlisted members over the age of 35, senior officers had statistically significantly lower PHA currency rates at each age category ( $p < 0.01$ ). In comparison to senior enlisted members, PHA currency for senior officers was more than 5% lower ( $p < 0.01$ ). However, junior enlisted members over the age of 35 had the lowest PHA currency, when adjusted for race and gender, although this subpopulation represented fewer than 200 active duty members (data not included in table).

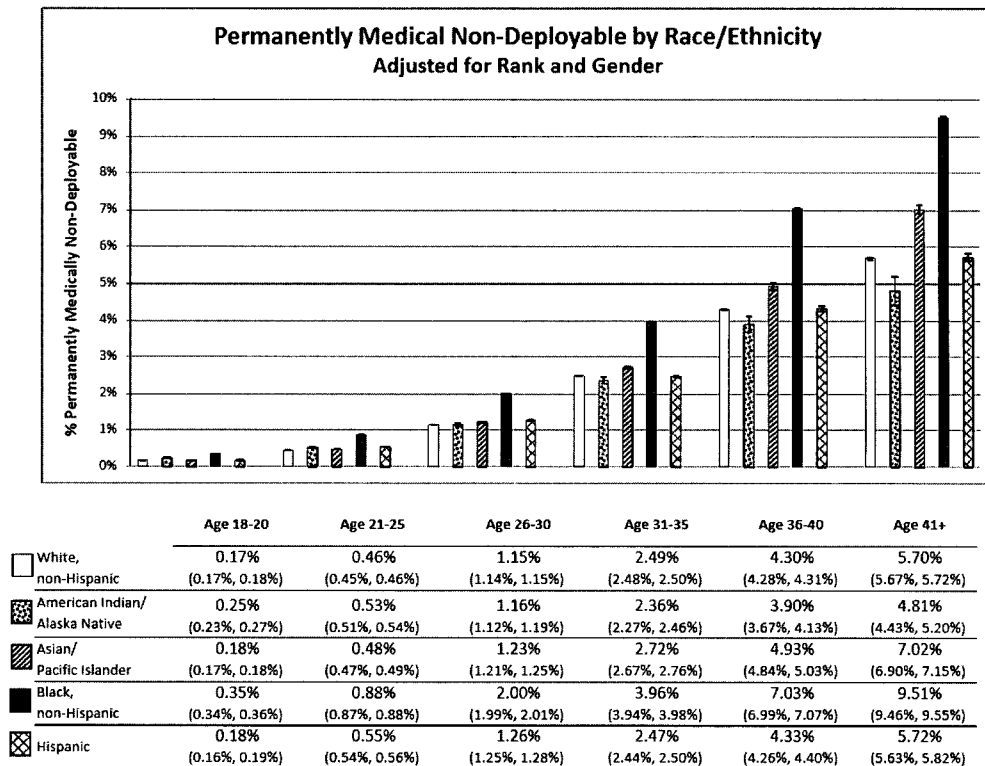
Permanent medical nondeployability also differed statistically significantly by rank. As seen in Figure 2, medical nondeployability increased with increasing age. When adjusted for race and gender, senior enlisted members were statistically significantly more likely to be medically nondeployable at every age ( $p < 0.05$ ), except when compared to junior enlisted members between 36 and 40 years of age.

### Influence of Gender on Race/Ethnicity Effect

Because PHA currency rates and medical deployability status differed by race/ethnicity, gender was evaluated to determine whether male or female status modified any effect that race/ethnicity had on these two outcomes. On the basis of the

**TABLE II.** Current Preventive Health Assessment by Race/Ethnicity, Adjusted for Rank and Gender ( $N = 297,429$ ).

	White Non-Hispanic	American Indian/ Alaska Native	Asian/ Pacific Islander	Black Non-Hispanic	Hispanic
Age Range	Adjusted PHA currency rate (%), with 95% confidence interval				
18–20	95.36 (95.34, 95.38)	96.58 (96.54, 96.62)	94.87 (94.83, 94.92)	97.51 (97.50, 97.53)	97.12 (97.09, 97.14)
21–25	95.42 (95.40, 95.45)	96.26 (96.02, 96.49)	95.87 (95.77, 95.98)	97.08 (97.06, 97.10)	96.81 (96.75, 96.87)
26–30	95.40 (95.39, 95.41)	95.19 (95.05, 95.34)	95.56 (95.52, 95.61)	96.04 (96.02, 96.05)	95.56 (95.52, 95.59)
31–35	94.00 (93.97, 94.02)	95.15 (94.95, 95.34)	93.20 (93.09, 93.32)	94.00 (93.95, 94.04)	94.17 (94.11, 94.23)
36–40	92.76 (92.72, 92.79)	93.49 (93.05, 93.94)	91.68 (91.46, 91.90)	91.68 (91.59, 91.78)	91.64 (91.50, 91.78)
41+	91.66 (91.63, 91.70)	91.99 (91.42, 92.57)	92.58 (92.39, 92.77)	91.54 (91.44, 91.64)	90.29 (90.13, 90.46)
Overall	94.30 (94.29, 94.32)	95.22 (95.09, 95.34)	94.61 (94.55, 94.66)	94.93 (94.91, 94.96)	94.51 (94.46, 94.55)

**FIGURE 1.** Permanent medical nondeployability status (C-coded) rates by race/ethnicity, adjusted for rank and gender ( $N = 297,429$ ).

statistical model, gender did not moderate the effect of race/ethnicity on PHA currency rates ( $p = 0.61$ ). However, the effect of race/ethnicity on medical deployability was influenced by gender ( $p = 0.038$ ). As already identified, Black non-Hispanic and Asian active duty members demonstrated increasingly higher rates of medical nondeployability with increasing age, when compared to White non-Hispanics. However, the rate of increase was actually lower for women than for men, particularly for American Indian/Alaska Natives, Asian/Pacific Islanders, and non-Hispanic Blacks. This difference in rates between men and women was not identified for Hispanics or non-Hispanic Whites.

#### **Influence of Rank on Race/Ethnicity Effect**

Rank was found to moderate the effect of race/ethnicity on both PHA currency ( $p < 0.0001$ ) and medical deployability

( $p = 0.007$ ). Overall, White non-Hispanic active duty members had lower PHA currency rates. However, among senior officers, non-Hispanic Whites had overall PHA currency rates more than 2% greater than any other race/ethnicity category, and more than 5% greater than non-Hispanic Black active duty members. This effect was not observed for junior enlisted, senior enlisted, or junior officers.

The identified effect of race on medical deployability was that American Indian/Alaska Natives and Hispanics had lower nondeployability rates than White non-Hispanic active duty members. When the interaction of rank and race was included in the model, however, this difference was more pronounced in higher ranks and not consistently observed among junior enlisted members. However, this moderating effect of rank on the race effect was not observed for non-Hispanic Black or Asian active duty members.

**TABLE III.** Current Preventive Health Assessment and Permanent Medical Nondeployability Status (C-coded) by Gender, Adjusted for Race/Ethnicity and Rank ( $N = 297,429$ ).

	Men	Women
Current Preventive Health Assessment		
Age Range	Adjusted PHA Currency Rate (%), with 95% CI	
18–20	95.90 (95.88, 95.92)	95.30 (95.24, 95.35)
21–25	95.66 (95.64, 95.69)	96.17 (96.12, 96.21)
26–30	95.58 (95.57, 95.59)	95.31 (95.29, 95.33)
31–35	94.06 (94.04, 94.08)	93.61 (93.57, 93.65)
36–40	92.60 (92.56, 92.63)	92.04 (91.95, 92.12)
41+	91.66 (91.62, 91.70)	91.31 (91.22, 91.40)
Total	94.40 (94.39, 94.41)	94.56 (94.54, 94.59)
Not Permanently Medically Nondeployable (C-coded)		
Age Range	Adjusted Nondeployable Rate (%), with 95% CI	
18–20	0.12 (0.12, 0.12)	0.46 (0.46, 0.47)
21–25	0.43 (0.43, 0.43)	0.88 (0.88, 0.89)
26–30	1.14 (1.13, 1.14)	1.89 (1.88, 1.91)
31–35	2.56 (2.55, 2.57)	3.41 (3.39, 3.43)
36–40	4.61 (4.59, 4.63)	5.30 (5.25, 5.34)
41+	6.26 (6.23, 6.28)	6.66 (6.60, 6.72)
Total	2.32 (2.31, 2.33)	2.57 (2.55, 2.59)

## DISCUSSION

Overall, PHA currency rates were very high for the USAF active duty population. Although non-Hispanic Whites had the lowest overall PHA currency rates, the difference was clinically insignificant and does not suggest evidence of any health disparity. This finding differs from studies accomplished outside of the military, which have identified that racial and ethnic minorities generally have lower overall preventive care rates, even among those with access to healthcare.<sup>33–35</sup> However, there is evidence that Blacks and Hispanics are actually more willing to participate in preventive care than non-Hispanic Whites. In a telephone survey assessing willingness to participate in cancer screening, Blacks and Hispanics were more willing to participate than non-Hispanic Whites.<sup>36</sup> And, according to data from the Behavior Risk Factor Surveillance Survey for 1998–2001, among individuals with diabetes, Blacks and Hispanics also engaged in preventive care more frequently than Whites.<sup>37</sup> In addition to the equal access to care in the Air Force healthcare system, active duty members are mandated to complete a PHA and allowed time off of work to accomplish this appointment, which may help address many of the workplace barriers to accomplishing preventive care.

While non-Hispanic Whites were overall less likely to have a current PHA, rank moderated this relationship most significantly for senior officers. Only among this group, racial and ethnic minorities were less likely to receive a PHA, consistent with large-scale studies of healthcare usage.<sup>33–35</sup> It is possible that although a PHA is still mandated for senior officers, racial and ethnic minorities are less inclined to miss work to make the appointment. Even though the differences may not be considered clinically significant, a difference of 5% in PHA currency for non-Hispanic Black senior officers represents 74 individuals that have not completed a preventive care assessment in the previous 18 months.

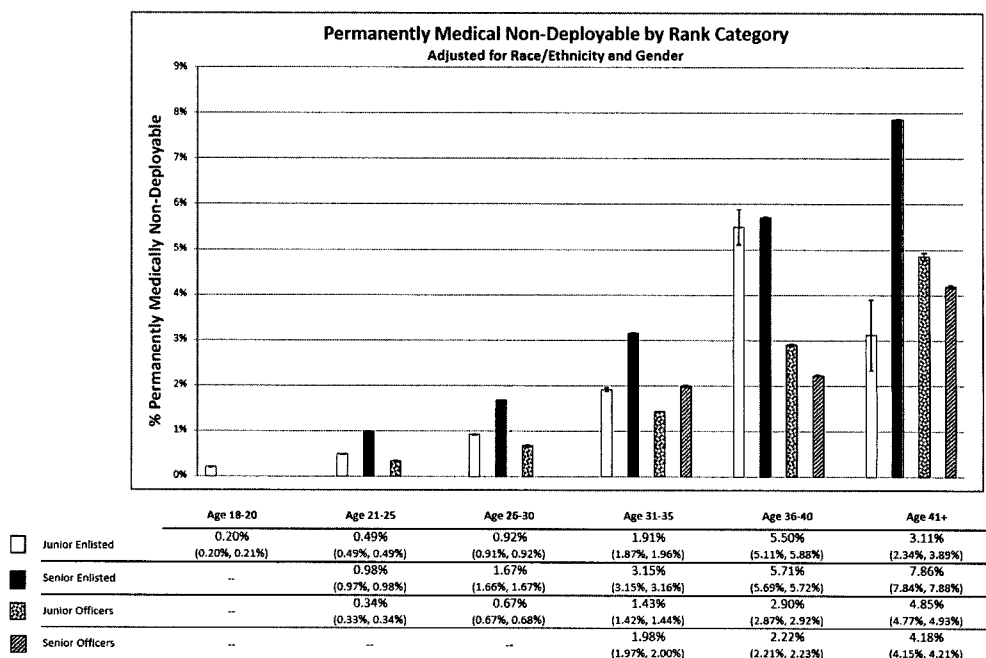
Although non-Hispanic Blacks were overall more likely to participate in preventive health exams compared to non-Hispanic Whites, non-Hispanic Blacks had statistically significantly higher rates of being permanently medical nondeployable. Racial differences in health outcomes are not always associated with access to health care, as identified in a study of patients with cardiovascular disease.<sup>38</sup> A study of asthma incidence rates in the Navy also found that Blacks had the highest rates of asthma, compared to all other race/ethnic groups.<sup>9</sup> Since a diagnosis of asthma is one condition that is generally associated with medical nondeployability, it is possible that chronic conditions such as asthma may also contribute to the disparity noted for non-Hispanic Blacks, compared to non-Hispanic Whites. Further evaluation as to the actual cause of nondeployability would be able to provide actionable information to address this identified disparity.

Rank also moderated the effect of race on medical nondeployability rates. For American Indian/Alaska Natives and Hispanics of increasing rank, nondeployability rates were lower (better) than their non-Hispanic White counterparts. Asian/Pacific Islanders and non-Hispanic Blacks, however, demonstrated consistently higher nondeployability rates compared to non-Hispanic Whites at every age and every rank category. This is consistent with data from the U.S. National Health and Nutrition Examination Survey indicating that increasing educational level (often associated with socioeconomic status) was associated with increasing self-rated health status for Whites, but not for Blacks.<sup>39</sup> Gender also moderated the effect of race on medical nondeployability, with American Indian/Alaska Native, Asian/Pacific Islander, and non-Hispanic Black women demonstrating a lower rate of increase in medical deployability at older ages. It is likely that this is associated with older women with chronic medical conditions electing to separate from the military, while older women that were deployable remained on active duty.

The differences in PHA currency and medical deployability between active duty men and women were statistically significant, but not clinically significant, as the predicted differences were less than 1%. This is contrary to reports from civilian healthcare systems, where women have been found to have higher healthcare expenditures<sup>40</sup> and higher cancer screening rates,<sup>41</sup> compared to men. The results of this study, however, are more consistent with findings from the Veterans Affairs healthcare system, where women were statistically significantly less likely to have received a pneumococcal vaccine ( $p < 0.01$ ) or influenza vaccine ( $p = 0.03$ ), although these differences were very small (adjusted relative risk: 0.98 and 0.99, respectively).<sup>42</sup> An analysis of functional status between men and women identified that although women had lower functional status than men, at younger ages gender differences were significantly smaller.<sup>43</sup> Consequently, the clinically insignificant differences identified between men and women in PHA currency and medical deployability could also be attributed to the fact that this population is quite young.

**TABLE IV.** Current Preventive Health Assessment by Rank Category, Adjusted for Race/Ethnicity and Gender (*N* = 297,429).

	Junior Enlisted	Senior Enlisted	Junior Officer	Senior Officer
Age Range	Adjusted PHA Currency Rate (%), with 95% CI			
18–20	95.75 (95.73, 95.77)	—	—	—
21–25	96.50 (96.49, 96.50)	96.26 (96.25, 96.27)	87.50 (87.34, 87.66)	—
26–30	96.31 (96.30, 96.32)	95.88 (95.87, 95.88)	93.42 (93.41, 93.43)	—
31–35	94.91 (94.85, 94.97)	94.96 (94.96, 94.97)	92.27 (92.25, 92.29)	88.23 (88.16, 88.30)
36–40	72.60 (69.24, 75.96)	94.41 (94.41, 94.42)	90.66 (90.64, 90.68)	87.05 (87.01, 87.09)
41+	35.86 (34.06, 37.66)	93.80 (93.79, 93.81)	93.68 (93.59, 93.76)	88.21 (88.18, 88.23)
Total	96.30 (96.29, 96.31)	95.01 (95.00, 95.01)	91.64 (91.60, 91.68)	87.83 (87.81, 87.86)

**FIGURE 2.** Permanent medical nondeployment status (C-coded) by rank category, adjusted for race/ethnicity and gender (*N* = 297,429).

Of all the results evaluating differences in PHA currency and medical deployability by rank, the most dramatic differences noted were the extremely low PHA currency rates for junior enlisted members over the age of 35 and high medical nondeployability status for junior enlisted between the age of 36 and 40. It is likely that these results are associated with the fact that by the age of 35 (usually 17 years of active duty service), most enlisted members have been promoted to senior enlisted ranks. Although reasons for active duty members to remain in the junior enlisted ranks after the age of 35 can vary, low job satisfaction has been shown to influence overall health practices for employees.<sup>44</sup> Although this is a very small group of individuals (fewer than 0.05% of the population), the results suggest that these individuals are much less likely to receive preventive care and more likely to develop medical conditions that limit deployments.

Socioeconomic status (SES) has been consistently linked to health outcomes, with lower SES associated with worse health outcomes<sup>5</sup> and fewer healthcare appointments.<sup>45</sup> While military rank does not explicitly reflect an individual's total

income or net worth (often used to determine SES), rank is a valuable measure of occupational prestige, as well as a baseline measure of educational level, income, and occupational status. In this study those with the highest SES, the senior officers, had the lowest overall rates of PHA currency. Similarly, junior officers also had lower PHA currency rates than senior enlisted members. While it is unclear why the higher ranks would be less likely to complete a preventive health exam, higher SES has been associated with fewer ambulatory care visits in Canada (which has universal access to care)<sup>46</sup> and lower likelihood of deciding to go to the emergency room for an emergent condition in the United Kingdom.<sup>47</sup>

Permanent medically nondeployable rates were highest for senior enlisted members. A seminal study of British civil servants identified that lower socioeconomic status was associated with higher mortality rates<sup>48</sup> and subsequent studies have identified that overall health is lower for those with lower socioeconomic status, as well.<sup>49</sup> Given this, it is unclear why the junior enlisted members, those with the lowest rank, were actually less likely to be nondeployable (healthier) than senior

enlisted members. The reasons are likely complex, but may be affected by the number of senior enlisted members electing to remain in the military despite medical conditions designate them as nondeployable, whereas junior enlisted members elect to separate, or are discharged, from the military. However, the finding that junior officers and senior officers were less likely to be nondeployable compared to senior enlisted members is consistent with existing research.

### Limitations

There are several limitations to this study. First of all, there is a reliance on existing data sources, and although the data are used operationally, there is the possibility that it may not adequately reflect the current health status of every active duty member. In fact, it is possible that the data set may actually underrepresent the number of individuals that should be medically nondeployable.

Additionally, this study is not able to determine the true cause of the identified disparities. Although it is outside the scope of this study, it is possible that the disparities may be the result of operational requirements or could be associated with medical discharge rates. However, it would be anticipated that these factors would affect active duty members equally, regardless of race/ethnicity, gender, or rank.

### Future Studies

The findings of this study suggest that additional research would be beneficial to determine why active duty members of higher rank are less likely to have a current PHA. This preventive appointment not only is essential to ensure adequate health screening, but is also a requirement for all active duty members. Research that examines the underlying cause could improve preventive care and ensure that all active duty members benefit from the prevention efforts. As mentioned, additional investigation of junior enlisted members over the age of 35 is also warranted to determine the reason this population, albeit quite small, has significantly lower PHA rates and higher nondeployable rates.

More importantly, however, future research is needed to determine why Asian/Pacific Islanders, non-Hispanic Blacks, and senior enlisted members are much more likely to be permanently medically nondeployable. On the basis of the theoretical model, it is possible that this disparity could be the result of systemic factors or discrimination. Research studies that rely on a different design—particularly those eliciting the perspective of individual active duty members and their perceptions and beliefs about barriers to accessing and receiving healthcare in the Air Force healthcare system—would be particularly helpful to determine whether policy or organizational changes are necessary.

### CONCLUSION

When adjusted for rank and gender, PHA currency rates for minorities were higher than for non-Hispanic Whites, although

permanent medical nondeployability was higher for Asian/Pacific Islanders and non-Hispanic Blacks than non-Hispanic Whites. Although there were statistically significant differences in PHA currency and nondeployability status by gender, these differences were clinically insignificant. Overall, PHA currency rates were lower for senior officers and junior officers, although senior enlisted members were more likely to be medically nondeployable. On the basis of these findings, there is evidence that health disparities exist among active duty members in the USAF, even in an equal-access-to-care healthcare system. Future studies are needed to determine the source of this disparity.

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